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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,552	11/20/2003	Jacob Karin	1494/28	5683

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EXAMINER	
LAVARIAS, ARNEL C	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/716,552	KARIN, JACOB	
	Examiner	Art Unit	
	Arnel C. Lavarias	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *3/29/04,3/11/04,11/20/03*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 10-13* is/are rejected.

7)☒ Claim(s) *7-9* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/11/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The '10/230,207' document in the 'U.S. PATENT DOCUMENTS' section of the PTO-1449 form filed 3/11/04 has been lined through since this document was not cited in the appropriate section of the PTO-1449 form. It is noted that this document has been considered by the Examiner, and thus has been cited in the 'NON-PATENT DOCUMENTS' section of the PTO-892 form attached to this Office Action.

Drawings

2. The original drawings were received on 11/20/03, and the formal drawings were received on 3/29/04. The formal drawings are acceptable.

Specification

3. The disclosure is objected to because of the following informalities:

Page 2, line 3- 'in' should read 'is'

Page 7, line 3- after 'less than', insert '45°'

Page 7, line 4- after '9A and', '9' should read '9B'.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-2, 4-6, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. (U.S. Patent No. 5801880).

Matsuda et al. discloses a microscope arrangement (See for example Figures 2-4, 6-8, 10-14) for simultaneously inspecting a plurality of spots on the surface of a substrate (See for example 12 in Figure 2), the arrangement having an optical axis (See for example 'a' in Figure 2) at an angle to the surface, the arrangement comprising at least one source of illumination (See for example 'LD' in Figure 2) directed non-parallel to the optical axis; an optical arrangement (See for example 11 in Figure 2) configured for directing the illumination to illuminate spaced apart spots on the surface of the substrate and for returning radiation from the spots, the optical arrangement including an array of reflectors (See for example 17 in Figure 2) located and angled so as to generate an array of spaced illumination beams substantially parallel to the optical axis (It is noted that the optical axes of the reflected and returning illumination beams appear to be collinear with that of the optical axis of the arrangement 'a'); and an array of optical sensors (See for example 15 in Figure 2), each of the sensors being spatially associated with a corresponding at least one of the reflectors so as to receive at least part of the radiation returned from the spot illuminated by the corresponding reflector. Matsuda et al. further

discloses the at least one source of illumination being implemented as a single source of illumination (See 'LD' in Figures 2-4); the array of reflectors and the array of optical sensors are arranged on a common substrate (See 17, 15, 16 in Figure 2); each of the reflectors is adjacent to the corresponding one of the optical sensors (See 15, 17 in Figures 2-4, 6-7); each of the optical sensors has a pair of the reflectors on opposing sides of the optical sensor, and wherein the at least one source of illumination provides illumination in two incident directions (See the various reflectors and various optical sensors, as well as the various sources 'LD' in Figure 7); each of the reflectors has a reflecting surface, a normal to the reflecting surface being less than or equal to 45 degrees to the optical axis (See 17, 'a' in Figure 2; col. 6, lines 12-22 an col. 7, lines 22-35); and the substrate having a base plane, wherein a plurality of the reflectors are mounted at differing heights above the base plane (See for example 11 in Figures 11-14, wherein the substrate including the reflectors is situated at an angle of θ from horizontal or from the optical axis of lens 46, and thus the reflectors 17 for each element 11, as shown in Figure 8, are all at slightly different height, depending on the location on the substrate, with respect to the horizontal). Matsuda et al. does not explicitly disclose the optical axis of the arrangement being perpendicular to the surface, the illumination of the source being substantially parallel, and each reflector reflecting at least 90% of incident radiation intensity. However, having the optical axis of the arrangement be perpendicular to the surface, having the illumination of the source be substantially parallel, and having each reflector reflecting at least 90% of incident radiation intensity are all obvious and well known to one of ordinary skill in the art. For example, although Matsuda et al. does not

not explicitly disclose the optical axis of the arrangement being perpendicular to the surface, Figure 2, as well as col. 6, lines 12-22 an col. 7, lines 22-35 of Matsuda et al. provides one of ordinary skill the required general teachings to adjust the optical axis of the arrangement to any particular angle, such as perpendicular to the substrate surface. Further, one of ordinary skill would have known to have the source light be collimated, instead of diverging as disclosed for example in Figure 2 of Matsuda et al., since diverging light requires larger-sized optical elements to further route the larger and expanding cross-section of a diverging light beam. Finally, having each reflector be highly reflecting, e.g. having each reflective surface of each reflector having reflectivities as close to 100% as possible, is known in the art to reduce optical losses in the system. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the optical axis of the arrangement be perpendicular to the surface, the illumination of the source be substantially parallel, and each reflector reflecting at least 90% of incident radiation intensity, in the microscope arrangement of Matsuda et al., for the purpose of 1) simplify the alignment of the optical system, 2) reduce the optical system size, weight, and cost, since optical elements of reduced size are utilized, and 3) maximize illumination light throughput in the optical arrangement.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. in view of Almogy et al. (U.S. Patent No. 6639201).

Matsuda et al. discloses the invention as set forth above in Claim 1, except for the at least one source of illumination being configured to provide illumination having a wavelength no greater than 266 nm. However, the use of ultraviolet wavelength sources

in confocal microscope optical systems is well known and conventional in the art. For example, Almogy et al. teaches the use of conventional laser, diode, or lamp sources that provide ultraviolet wavelength light (e.g. 13-14 nm) to provide for extremely high-resolution imaging (See col. 1, line 64-col. 2, line 17; col. 4, lines 26-59; col. 5, lines 1-12; col. 12, lines 53-65). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have the at least one source of illumination be configured to provide illumination having a wavelength no greater than 266 nm, as taught by Almogy et al., in the microscope arrangement of Matsuda et al., to increase imaging resolution of the microscope system.

7. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda et al. in view of Wakai et al. (JP 07181023A).

Matsuda et al. discloses the invention as set forth above in Claims 1, 4, except for the optical arrangement further including a microlens associated with each of the reflectors and deployed to focus parallel illumination to provide a pinhole illumination effect. However, the use of a separate microlens for each reflector, instead of a single lens used by all of the reflectors in the array, is known and conventional in the art. For example, Wakai et al. teaches a conventional confocal imaging system (See for example Figures 1-2, 4), wherein each separate reflector (See for example 4 in Figures 2, 4, wherein the separate holograms operate as reflective elements) in the reflector array has associated with it a separate microlens (See 5, 5a in Figures 2, 4) in the microlens array. Each of the microlenses function to take the light incident to it and focus the light down to a point. Thus, it would have been obvious to one having ordinary skill in the art at the time the

invention was made to have the optical arrangement further include a microlens associated with each of the reflectors and deployed to focus parallel illumination to provide a pinhole illumination effect, as taught by Wakai et al., in the microscope arrangement of Matsuda et al., for the purpose of simplifying alignment and routing of the individual light beams reflected from the reflector array, since each beam has a separate microlens operating on it, instead of only a single lens operating on the whole set of light beams.

Allowable Subject Matter

8. Claims 7-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

Claim 7 is allowable over the cited art of record for at least the reason that the cited art of record fails to teach or reasonably suggest the microscope arrangement for simultaneously inspecting a plurality of spots on the surface of a substrate, as generally set forth in Claims 1 and 4, the microscope arrangement further including, in combination, the array of reflectors and the array of optical sensors being arranged on a common substrate such that each reflector has a reflective surface with an aperture formed therein, wherein the corresponding one of the optical sensors is deployed to receive radiation returned from the spot via the aperture. Claim 8 is dependent on Claim 7, and hence is allowable for at the same reasons Claim 7 is allowable.

Claim 9 is allowable over the cited art of record for at least the reason that the cited art of record fails to teach or reasonably suggest the microscope arrangement for simultaneously inspecting a plurality of spots on the surface of a substrate, as generally set forth in Claims 1 and 4, the microscope arrangement further including, in combination, the array of reflectors and the array of optical sensors being arranged on a common substrate, and a diffractive optical element deployed for generating a plurality of illuminating radiation beams, each of the beams being directed towards one of the reflectors.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnel C. Lavarias whose telephone number is 571-272-2315. The examiner can normally be reached on M-F 9:30 AM - 6 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Arnel C. Lavarias
Patent Examiner
Group Art Unit 2872
5/13/05